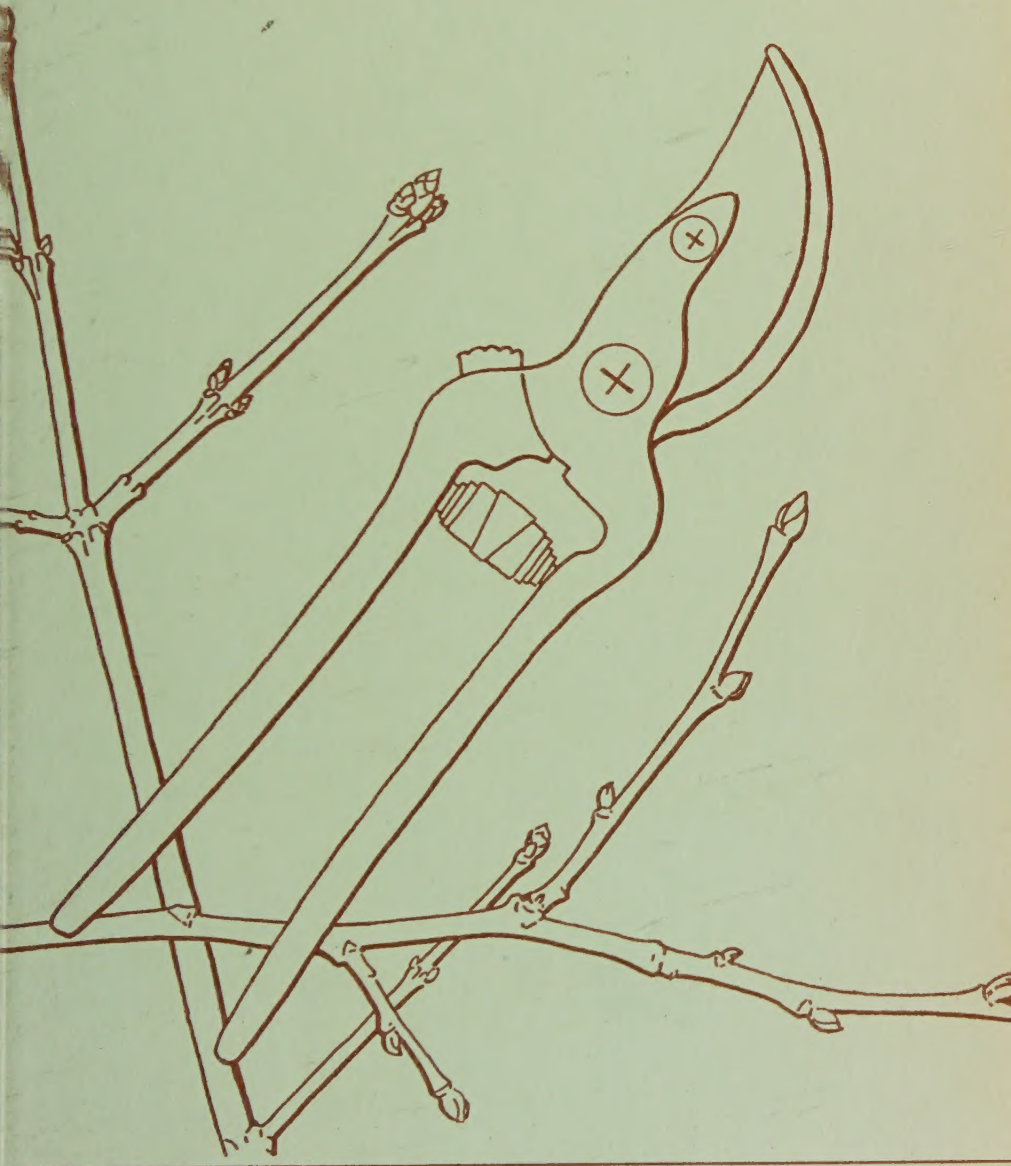
Fundamentals of Pruning Ornamental Trees and Shrubs



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Cover drawing by Louis G. Brenner

CONTENTS

Fundamentals of Pruning Ornamental Trees and Shrubs

The Response of Plants to Pruning
F. W. Went

The When and How of Pruning
Louis G. Brenner

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FUNDAMENTALS OF PRUNING ORNAMENTAL TREES AND SHRUBS

AMATEUR GARDENERS and home owners often find pruning of trees and shrubs a phase of gardening clothed in mystery and best left to the services of the professional, or if practiced at all, done with little understanding of the purposes and effect upon the plant. We present here the basic fundamentals of pruning, as we understand them to start the home gardener into a most interesting, engrossing and necessary aspect of caring for his garden. It is hoped this explanation will lead to an even deeper and more serious interest by the gardener who may wish to read and use the more detailed information presented by the authors suggested on the last page.

THE RESPONSE OF PLANTS TO PRUNING

F. W. WENT

A GARDENER can do a better job of pruning if first he understands what happens to a plant when it is cut or injured in any way, and second, what the plant will be like after it recovers from the operation. The foremost consideration in any pruning or trimming of plants is the buds.

DESIRABLE BUDS

A branch can only develop from the pre-formed buds, which are found at the end of a branch, or just above any place where a leaf is or was attached to a branch. If every bud grew, any plant would soon be a solid mass of branches. This happens at limited points in some diseases, such as the "witches broom." A plant has, however, a special device which makes only one out of every ten to one hundred buds grow, the rest being left as a strategic reserve, which can be called upon when the growing shoot is injured, cut off, or eaten by animals.

The method by which the plant keeps most buds inactive is that of diverting all food and other materials necessary for growth towards a relatively few growing buds, keeping the others starved. As soon as the growing bud is removed, the diversion stops, and the buds left nearest the cut immediately take advantage of the available food. But as soon as one of them gets the upper hand, it starts to inhibit the others by diverting all food toward itself. Thus no chaos results from pruning. The number of branches which take over from the one which

was removed is definitely limited. We know very little about the mechanism of this food diversion. The only thing we can say with certainty is that it is connected in some way with the production of the growth hormone, "Auxin," by the growing stem. The extreme tip and the youngest leaves of a branch produce a large amount of auxin. As soon as the production of this auxin by the branch tip stops, the diversion of food toward that tip stops, and other buds get a chance. When one or a few of these other buds produce sufficient auxin, this diverts the food toward them, and the situation is the same as it was before, except that one or more other branches have taken over from the original one. Thus the plant automatically adjusts itself to the effects of pruning or injury.

By pruning, a gardener can make almost any inactive bud grow. This is of special importance in shrubs and trees which form their flower buds in the year previous to blooming, as in the case of cherries, peaches, apples, plums, apricots and many flowering shrubs. In these deciduous fruit trees, the top buds and the ones of last year's growth are predominnantly vegetative, or in other words, give rise only to leafy shoots, and do not contain pre-formed flowers. The more swollen buds on the older wood are predominantly flowering buds. If left untrimmed, a larger proportion of the developing buds will be vegetative, which not only interferes with the development of flower buds, but also diverts food from growing fruit. When the majority of the last year's shoots are pruned off, a greater proportion of flowering shoots can develop and set fruit. And still a certain number of vegetative buds, which are mixed in with the flowering buds on the older wood, will grow out to keep the plant in a good, balanced condition.

In other plants, like the eastern lilac, the apical buds are usually flower buds, so that pruning during the winter destroys the next spring's flowers. It is not practicable to list for each plant when and where the flowers are pre-formed, but anyone can find this out for himself. A good hand lens and a few needles comprise the necessary equipment. Carefully pare the bud scales and small leaves away from a bud. If it is a flower bud, perfectly developed but as yet tiny, flowers will be found in between the small leaves. If only smaller and smaller leaves are seen inside, the bud was vegetative. All this is visible with a ten-times magnifying glass.

PLUMBING SYSTEMS

There is another—and important—reason why shrubs should be pruned. This is related to the reason why a shrub does not grow into a tree even though it seemingly has all the attributes of a tree. But just as the shoot of a shrub gets a good start it stops growing, and in many cases, it dies back to the ground, and has to begin all over again. Therefore, in the natural state, a shrub usually has much dead wood and has many stems which grow up from the root crown. In this respect a shrub holds the middle ground between a tree and a perennial whose above-ground stems die at the end of each year (aster, delphinium,

paeonia). The efficiency of the plumbing system of trees, perennials, and shrubs is the important factor in determining their span of life. The tree is, from every standpoint, an engineering marvel. Its plumbing system is most efficient.

The plumbing system of perennial plants is so inefficient that, after a season's growth, the strain under which the water moves through the vessels has become so great that the buds higher on the stems cannot make good connections and will not grow any more. The whole stem dies, and a bud on the rootstock, near the source of water, starts next year anew.

Something like this happens in shrubs. In the course of a few years, in many shrubs, the growth of the highest buds is not possible because of the relatively poor water supply system. An indication of the water stress is given a few years before the climax, when the new developing leaves stay smaller and flowers become smaller also.

When the main stem of a shrub dies, new shoots start to grow from near the root crown, and take over the place of the dead stem. The plumbing system in these shoots becomes overtaxed in the same span of time, and then everything starts over again.

In this case pruning can help, not by improving the plumbing, but by removing the buds too far away from the roots, causing buds lower down to develop where the water piping system will not be overtaxed so soon. There are different symptoms which show how much of the old branch has to be removed. Wherever the old branch seems thin in comparison with the number of leaves it has to supply with water, it should be cut. The buds on the thicker part of the branch farther down will give rise to more vigorous branches. Also, the branches bearing few and small leaves, as a consequence of a restricted water supply, should be cut off. In this way nature is helped and the shrub can be kept more vigorous, because it is not necessary for the whole branch to die before new shoots can grow.

Thus we have seen that the scientific foundations for pruning are: (a) removal of the less desirable buds, so that the more desirable buds can develop, and (b) removal of the weak buds, poorly supplied with water, thus forcing better located buds to grow. And the reason why new buds start to grow when the growing shoots are removed can be explained by the diversion of food toward the growing shoots.

The above explanation and the pruning directions given on the following pages should constitute valuable reading for every gardener who wants to prune more intelligently. These explanations here should emphasize, for instance, the repeated recommendations that old, useless or weak shoots be removed in favor of desirable and well placed shoots. *The fact that food is diverted to the buds left nearest the cuts should impress the pruner with the importance of carefully considering the placement of the buds to which he cuts during pruning operations on various shrubs and trees.*

THE WHEN AND HOW OF PRUNING

LOUIS G. BRENNER

THE REASONS FOR PRUNING

Pruning is primarily a process of removing portions of a plant to achieve certain specific results essential in good plant grooming. Some physiological reasons for pruning are set forth in the above paragraphs where Dr. Went discusses response of plants to pruning. Pruning should be undertaken with definite purpose in mind and not just because one sees his neighbor cutting away and decides this might be a good idea, especially if it is a beautiful day to be outside.

Many otherwise fine garden trees and shrubs have been ruined by thoughtless hacking. Valid reasons for pruning may be listed as: shaping or grooming, in which small portions of the plant are removed to maintain general conformity typical of the species; to maintain youthful vigor necessary for flowering and fruiting of shrubs; to improve health by removing diseased or injured parts; to maintain a plant in a specific habit for specific purposes; and to balance the crown to injured root system as occurs in transplanting. Finally, pruning must be undertaken when plants have been injured by storm, romping children or pets, and other accidents.

WHEN TO PRUNE

Proper time to prune has consistently baffled more gardeners than any other part of this relatively simple garden task. Necessarily, time of pruning is directly connected with the purpose cutting is to achieve and will be done in particular seasons of the year. Old hands at gardening say the time to prune is "when the knife is sharp," but his knife is always sharp and is wielded with due consideration for each individual plant. For those less experienced, the following thoughts may prove helpful.

Pruning for Shape

A large part of garden pruning will fall into this group which could perhaps be better named as "grooming." Healthy, vigorous plants quite often need a bit of careful snipping to keep them well formed and this can generally be done best during the growing season while the plant is in leaf. Flowering trees and shrubs, however, would be more properly shaped during the second and third week of July to insure against loss of flower buds on the branch thus shortened. Hedges generally may be shaped (sheared) at any time during the growing season with only the caution that heavy shaping be done in the first cutting and not left until August. Heavy shaping of hedges late in season could cause development of abundant new twig growth which may not mature (become woody) and be subject to winter freezing injury.

Pruning for Vigor and Flowers

Most woody plants, it has been shown, especially shrubs, respond vigorously to pruning, and this is essential toward keeping blooming shrubs in heavy flower. Simple general rules may be practiced by the gardener to keep his shrubs in good vigor and flower. Spring blooming shrubs such as Forsythia, Weigelia, Van Houtte Spirea, Philadelphus are best pruned and thinned out shortly after flowering. This is because the plants bloom on stems developed during the preceding season. Summer and the few fall blooming shrubs such as crepe myrtle, Vitex and Buddlea bloom on stems developed during the current season and should be pruned, thinned and shaped in early spring.

Holly, long the plant symbol of the Christmas season, has become increasingly popular in midwest gardens. Many gardeners decline to prune their hollies at the Christmas season in fear of injuring their trees. American and English hollies can safely be pruned for Christmas decoration. Such pruning, if carefully done, will maintain the characteristic pyramidal shape of the tree and will stimulate the production of new shoots which will bear heavily the next season. The gardener must remember that among the hollies the male and female flowers are borne on separate trees. Berries are borne only on female flowered trees, provided male trees for pollination are close at hand (or within several city blocks).

Roses have been a popular summer blooming shrub of midwest gardens since colonial days and make an excellent subject on which the gardener may apply the pruning principles set forth in these paragraphs. Roses, because of a rather fast habit of growth, respond quickly to pruning, thus enabling the gardener to correct and perfect his technique within a short period. Roses of the hybrid-tea and florabunda type in general should be shortened to approximately eighteen inches about mid-November, to prevent strong winter winds from shaking the plant loose in the soil when the soil is extremely moist as during a winter thaw. Major pruning of these roses is left until the end of March, at which time it is safe to remove winter protection. At this time dead canes and those killed by winter injury are removed, and remaining stems shortened to 8–12 inches. All stems with a diameter less than that of a lead pencil are cut away. It is of utmost importance in pruning roses to maintain a very wide and spreading habit of the plant to facilitate later pruning, and to permit thorough coverage of leaf surfaces later in the season when the plants must be sprayed for insect and fungal pests. Such an open habit is easily attained, if the pruner will exert diligence toward cutting to a bud pointing to the outside of the bush.

Climbing or rambler roses may be pruned shortly after blooming. At this time all the canes should be cut to within two or three inches of the ground. Climbing roses bloom best on wood developed during the preceding season, hence cutting to the ground assures the gardener of strong, vigorous blooming shoots for the following season. The gardener will find

it wise to reduce the number of shoots to about three or four of the very strongest, otherwise the canes will become too crowded on the trellis where there is great competition for light. Thus they will fail to develop abundant flower buds.

Pruning for Disease

Occasionally the gardener will find need to remove portions of branches or even the entire limb or shoot in the control of certain virus diseases or borer attacks. Such removal should be made at their first notice, cut back far enough to be certain all infection is out, and the removed portions burned on the trash fire immediately.

Pruning at Time of Transplanting

Almost every plant that is moved from its original growing site will need some pruning attention to balance the stem structure with the root system reduced by the process of digging. Plants dug with bare roots will need at least half of the branches removed, leaving only a well-spaced skeleton of main limbs. Balled plants will usually succeed if at least one-third of the branches are removed. Such pruning is gauged to insure quick recovery from the shock of transplanting and also to prevent die-back of limbs by reason of a reduced root system unable to support an overbalanced top. Can-grown plants generally should be left unpruned unless roots have grown through the bottom of the can, in which case the top will have to be brought into balance by removing branches to approximately half of the total length of roots lost. In most cases it will be found practical to cut off roots growing through the bottom of the can to facilitate removal of the plant without breaking the ball of soil encasing the roots within the can. Pruning of top for transplanting should be done at time of moving the plant and will generally be found easiest while the plant is out of the ground and can be maneuvered into handy positions for making precise cuts. Shade trees such as oaks, sweetgum and maples; conifers such as pine, spruce, cypress; and broadleaf evergreens such as holly and bullbay magnolia should never have the main stem cut back because the single straight trunk is essential for development of a stout, sturdy specimen in later years of growth.

Pruning for Storm Damage

Limbs and portions of limbs damaged by storm, or in other ways, should be removed to the trunk or cut back to the nearest branch immediately, and the cut painted to prevent possible infection. Prompt attention at any season will eliminate dangling members which could cause further injury to the remaining portion of the plant.

Pruning Shade Trees

Shade trees are generally pruned through the winter and into early spring. Absence of leaves renders it easy to observe the branching pattern, and also makes individual branches lighter in weight, thus reducing the hazard of stripping bark when limbs are cut for removal. It is wise to observe some few trees as exceptions to this rule. American and slippery elms and silver maple bleed badly if cut in early spring, and may continue to do so until mid-June. These trees are properly pruned about the end of June,

or if in winter, not later than the end of December. Shaping-pruning, where limbs less than one and one-half inches are removed, or when dead limbs are to be removed, may be done at any season. It will be prudent to paint all wounds and cuts one inch or over with a wound dressing.

PRUNING TOOLS

Most home gardeners will be able to give their plants good maintenance with comparatively few tools. At least three tools are essential—a good hand pruner, a lopping shear (long-handled pruning shear) with twenty-four inch handles, and a curved pruning saw, having not less than eight teeth to the inch. Those having numerous trees may want to add to this list a curved blade pole saw and a pole shears and perhaps even fifty feet of one-half inch or larger rope, and a twenty-foot extension ladder.

Following are some considerations in selecting tools for pruning work. As with most garden tools, it is most advisable to purchase high quality tools for pruning, for good steel blades stay sharp and make neat cuts essential to rapid healing of wounds. Handles of pruning tools are under great strain and must be of high quality.

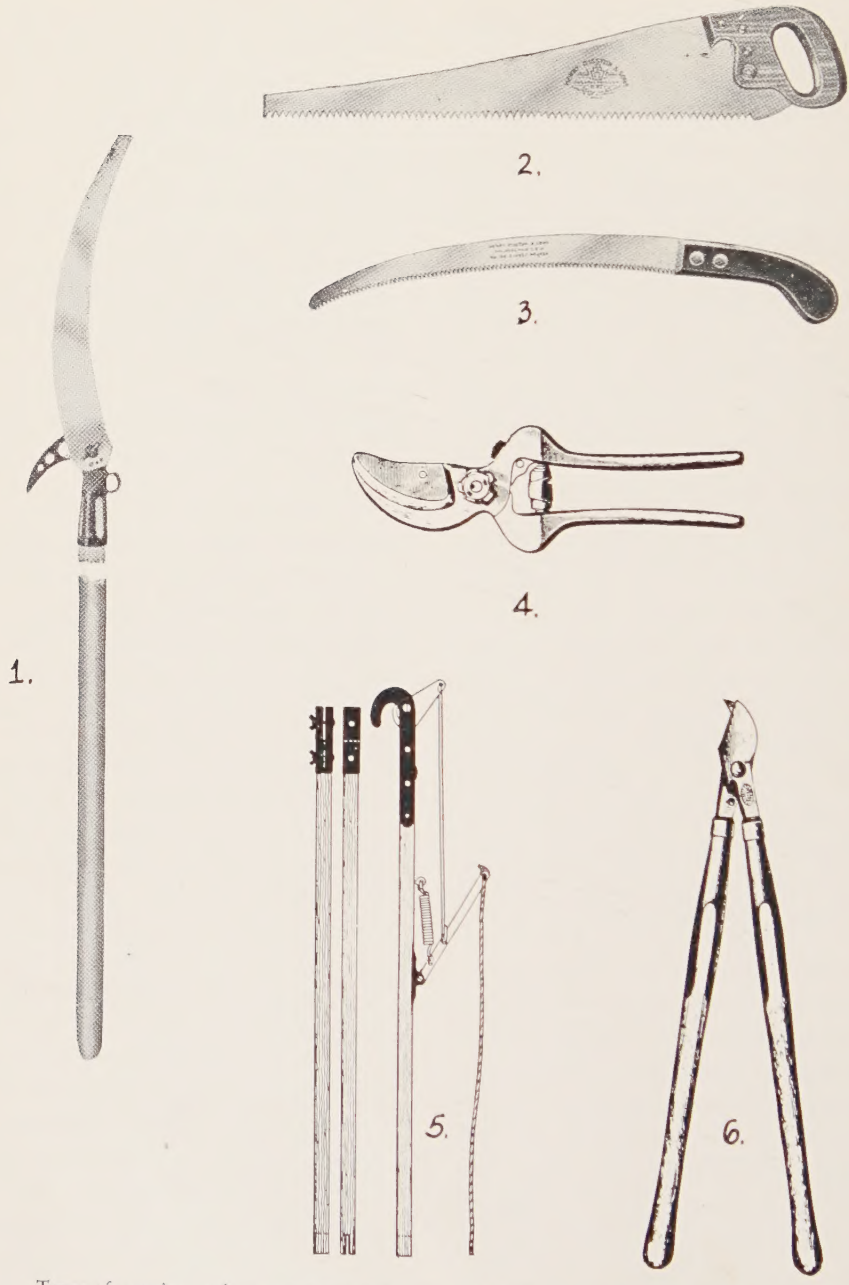
Hand Pruning Shear

For most gardeners the hand pruning shear is an indispensable tool. For general, all-around use, a shear having an overall length of about eight inches will cut the smallest twig and also fairly large branches. In using this tool, the gardener is warned against using a twisting motion as he cuts, for this can cause springing of the blade and result in failure of the tool to cut clean. The gardener is also cautioned against cutting larger branches of tougher woods with the hand pruner, for this task is more effectively accomplished with the lopping shear. Gardeners will find the type of hand pruner having a lock high on the grip near the pivot point easier to use. Those with a lock on the lower end of the grip often result in painful blisters on the palm of the hand.

Lopping and Pole Shears

For those having many shrubs and trees in their garden a good lopping shear is an important tool. This long-handled shear is designed for making cuts too heavy for the hand pruner. The pruner will also find it eliminates some stooping, and its long handles make it a handy tool for trimming low-hanging limbs from trees without the use of a ladder. As with the hand pruner, caution is required not to make a twisting motion when heavier limbs are cut, as this could spring the blades. Limbs that cannot be cut easily with the lopping shear should be left for the saw.

The pole shear makes a very handy tool for light shaping of trees and very tall shrubs. It must be remembered that the cutting capacity of this tool is very limited and does not exceed that of the hand shears. The pole shear has the distinct advantage of reaching those difficult branches impossible to reach with a ladder and hand or lopping shears.



Types of pruning tools as suggested in the text: 1. Pole saw; 2. Pruning saw; 3. Curved pruning saw; 4. Hand pruning shear; 5. Pole pruner; 6. Lopping shear.

Pruning Saw

Though an ordinary carpenter's saw can be used in the pruning of large shrubs and trees, the gardener will find the pruning saw an easier tool to use. Pruning saws have a coarser set to the teeth. Some have teeth set to cut on both push and pull stroke, and will cut green woods much more easily than other saws. The gardener will find a narrow, curved-blade saw with fine teeth most handy for general pruning. Here one is warned against the use of certain narrow, straight-blade saws having fine teeth on one edge and coarse on the other. Such tools often cause serious injury to nearby limbs when working in close places. A large saw similar to the carpenter's saw, but with pruning saw set to the teeth, is very handy when pruning large limbs in trees. A pole saw having a curved, fourteen to eighteen inch blade mounted at the end of a ten to twelve foot pole is quite handy for tree work.

Paint

It is standard practice among tree surgeons to paint wounds resulting from removal of limbs or accidental damage to bark to guard against infection of exposed wood by fungi and ravage by borers. For this purpose there are definite limitations to the sort of material used. The gardener is cautioned against using paints containing volatile thinners such as turpentine, benzol, etc. Asphaltic paints are recommended. Specially-prepared wound dressings can be obtained from reliable seed stores and nurseries, and would doubtless be the safest dressing to use. When paints containing volatile thinners are used, considerable importance lies in possible injury to the tender thin growing layer, cambium. This tissue will, in time, develop the natural healing scar covering the wound.

Care and Maintenance of Pruning Tools

Like all sharp-edged cutting tools, the gardener's pruning tools will require regular and careful attention if they are expected to work efficiently, make neat and clean cuts so necessary for quick healing of the pruning wound. Immediately after use, tools should be washed clean of all sap and gummy residues with a stiff brush and water, dried thoroughly and well oiled to prevent rust. Tools used to cut away diseased portions of plants should be disinfected with strong alcohol to prevent possible infection of other healthy plants. Blades of pruning and lopping shears should be touched up regularly with an oil stone or fine file. However, only the beveled-edge blade should be so sharpened, the other unsharpened should never be touched. If the shears fail to make a clean cut or tear bark in cutting, the blade has probably been sprung by twisting the shears in cutting, or attempting to cut too large a stem. Sharpening of pruning saws should be left for the professional. The cost is nominal. Handles of pole saws, lopping shears and pole saws should be rubbed with linseed oil occasionally to keep the wood smooth and free from weather cracking.

HOW TO PRUNE

Despite the fact that many fine, well-illustrated books and pamphlets have been written on the subject of pruning, the gardener will draw his best lessons from his own garden if he will but take the time to closely observe each individual species and its peculiar manner of growth and blooming. Particular attention must be given to the arrangement of the bud, leaf and flower and shoot buds because these, as pointed out by Dr. Went, determine the type of growth the gardener can expect from the plant after pruning.

Among shrubs and trees commonly grown in gardens, there are two types of arrangement of the bud on the twig. These give origin to typical habits of growth of the plant. Basically, buds have either an alternate or an opposite arrangement on the twig. The gardener will find that a greater number of plants will have an alternate arrangement of buds. Such arrangement of buds accounts for more common habits of growth. Alternate budding usually gives rise to rounded, pyramidal, inverted pyramid, or columnar-shaped plants. Opposite budding rarely leads to anything more than a rounded shrub or tree with a rounded crown. Position of the last bud or pair of buds left on the twig will determine the direction in which the new shoot will grow. Buds on the top of the twig will probably grow upward at an angle. The bud on the side of the twig will grow outward at an angle, and to the side in which it is directed. In opposite budded plants, when the cut is made to a pair of buds in lateral position, both buds often grow. Observation of bud arrangement and care in selecting the terminal bud to be left, is of utmost importance in the development of shapely plants. Care in selection of terminal buds can also reduce much pruning work later on, if the pruner will exercise caution not to direct the bud and its potential shoot toward another branch where there is little light for growth and possibility of chafing of branches.

The gardener who would become proficient in the art of pruning must learn that the pruning task is not finished when the shears are washed, oiled and hung on the rack, and the brush disposed of. He must watch the buds left from his cutting expand, the shoot lengthen and mature to flower and fruit. From close regular observation he will learn his mistakes and how to correct them when the pruning shears are next taken in hand. He will also experience the supreme satisfaction of directing the course of nature in one of the few ways permitted to man.

Pruning for Shape

Often trees and shrubs send out a particularly vigorous shoot which, if left to continue growth, would spoil the appearance of an otherwise shapely plant. Such shoots can be safely shortened to proper length early in July. It is important that such shoots on spring-flowering shrubs be shortened in July to permit resulting lateral growth to mature and develop flower buds. In most cases, the gardener will find his hand pruner will

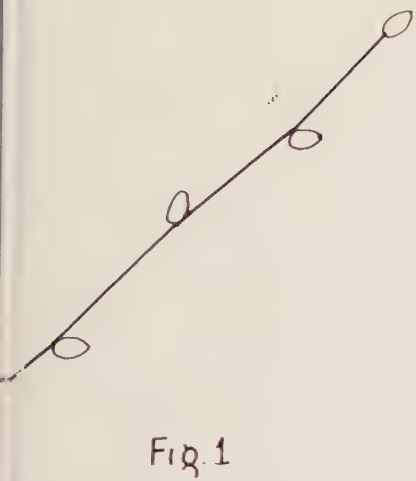


Fig. 1

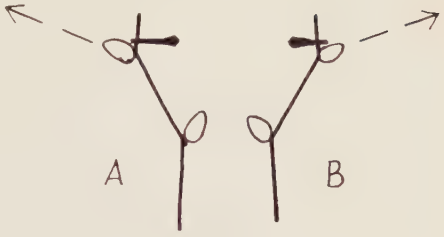


Fig. 2

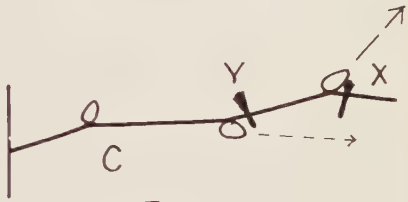


Fig. 3

Fig. 1. Typical stem with alternate buds. After pruning direction of growth is determined by position of bud immediately below cut. Fig. 2 A, B. Top view of alternate budded branch, shows pruning cut to direct growth right or left side. Fig. 3. side view of alternate budded branch, cut at "X" encourages growth out and up, cut at "Y" encourages horizontal growth, rarely down.

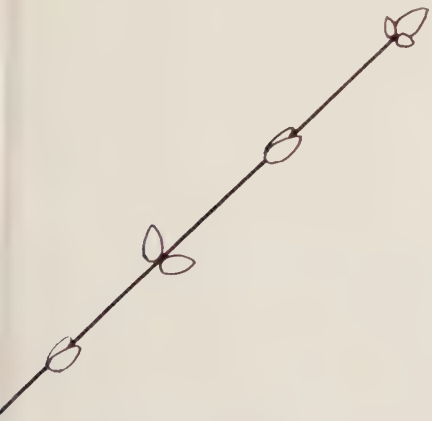
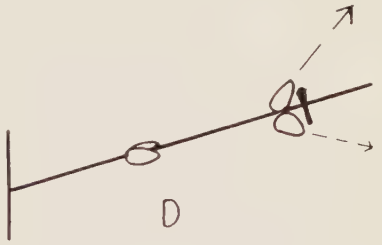


Fig. 4



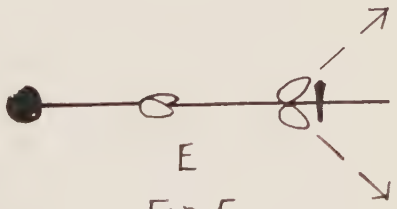


Fig. 5

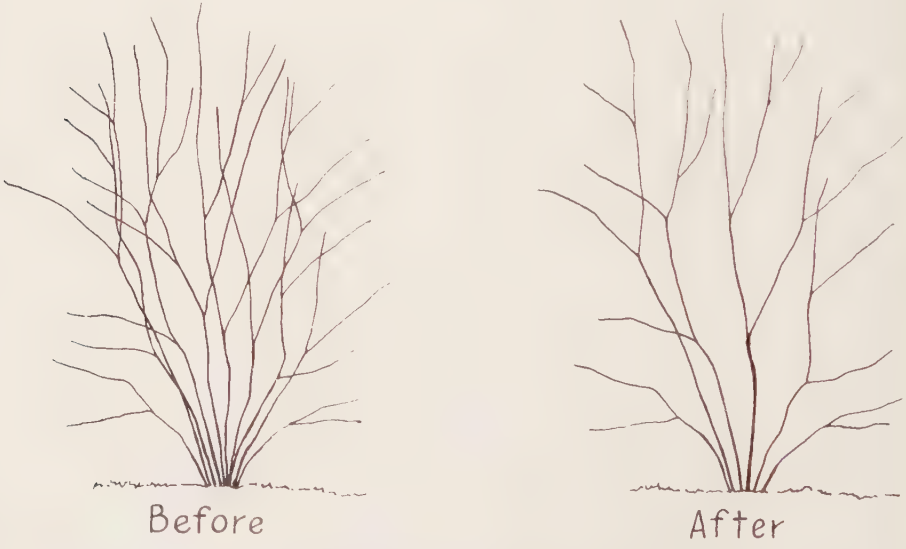
Fig. 4. Typical stem with opposite buds; note each pair of buds usually arranged at right angle to pair above and below on stem. Fig. 4 D. Side view of opposite budded stem, buds in vertical plane; top bud produces most vigorous shoot in out and up direction. Fig. 5 E. Top view of opposite budded stem, buds in horizontal plane; both buds usually grow at equal rate in horizontal plane.

perform this task, or for trees, the pole shear.

Shaping of evergreens, such as junipers, yews, arbor vitae, should be done in early spring, as the plants usually reach maximum elongation of the new shoot early in July. Pine, Spruce and Fir can be shaped by snipping off the tips of over-long branches in March or April. However, care must be exercised not to remove more than one-third of the total leafy area of any one limb.

Pruning for Vigor

Shrubs, more than trees, require pruning attention to maintain vigorous shoots, capable of producing abundant flowers. Most often, the gardener will find it most practical to remove old shoots to the ground level, using the lopping shear or small saw. Usually the third year after the shrub has been planted, and by each succeeding year, it is advisable to remove several older shoots to maintain a youthful, vigorous condition of the plant. Generally, the dark, heavily-barked shoots are old and produce few flowers. Such old shoots, because of their lack of vigor, are prone to attacks by borers, which may be attracted in sufficient number to bore into younger shoots as well. The pruning gardener should take advantage of the fact that most shrubs bloom best on young wood. Spring-blooming shrubs should be thinned quite harshly to force abundant new shoots to bloom the next season. Such cutting, of course, takes place soon after flowering. Summer-blooming shrubs receive similar treatment in early spring.



Flowering shrubs should have old stems removed, remaining stems thinned out if necessary, to encourage young vigorous growth capable of producing abundant flowers.

In any case, the gardener should check his plants regularly, and when the new shoots reach about four inches they should be thinned to an even spacing to insure even light to all. Shoots cut to the ground are often replaced with four to five vigorous new shoots. The gardener will find it advisable to leave only one or two of the strongest, and these spaced about four inches apart. Attention to this detail will make future removal of old stems much easier, because they can be easily reached with lopping shears or saw without injury to nearby shoots.

Certain old shrubs that have gone without pruning attention for many years may be rejuvenated by removal of old stems over a period of at least two years. Such removals should be done in early spring.

Some spring-blooming shrubs, such as Forsythia, the gardener will find will bloom especially well if the entire plant is maintained in a quite open branch system to permit abundant light to reach the stems, in which case the plants often bloom over the entire length of the shoot.

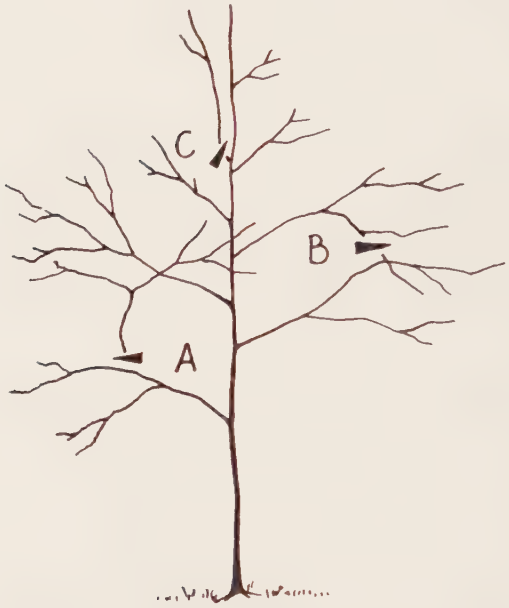
Pruning Trees

Trees in general require less pruning attention than shrubs but, unlike shrubs, whose outstanding characteristic beauty lies in continual rejuvenation, trees gain beauty and majesty through age. The pruner, therefore, is cautioned that the effects of his pruning of trees is of long duration. Pruning of shade trees is most often directed toward development of strong, straight trunks with a well-spaced scaffold of limbs. Pruning should begin with the first season after the tree is planted. Early attention is directed toward development of the straight trunk without narrow crotches or "V"s. Branches are encouraged to leave the trunk at wide angles, as these prove strongest in strong wind and storm. In later years, as increasing numbers of limbs develop, attention is given to removal of limbs that grow toward the interior of the crown, and also those that lie across one another and chafe and rub.

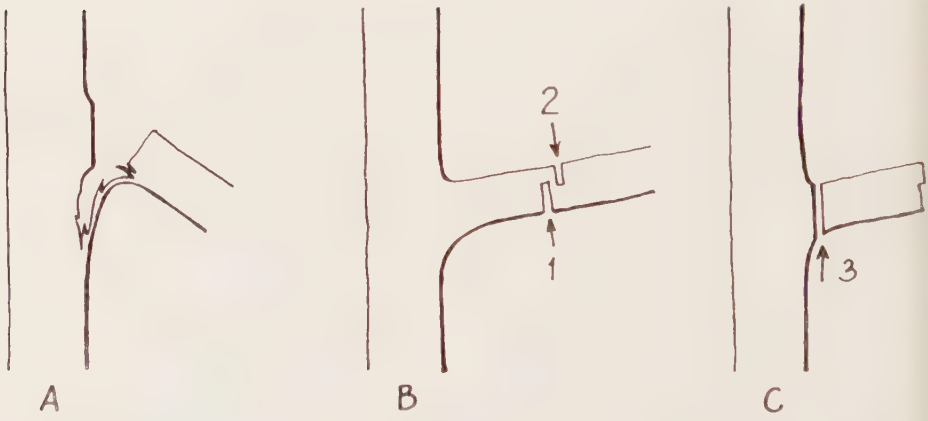
It is especially important that flowering trees, especially crabapples and hawthorne, receive corrective pruning when quite young, for major limb removal after the plant matures to blooming age, leads to development of numerous water sprouts (sucker shoots), which cause much additional pruning work, and if left unattended, most often ruin an otherwise shapely tree.

The Pruning Cut

In all pruning successful healing of the wounds resulting from the removal of limbs is directly related to the craftsmanship practiced in making the pruning cut. Healing or callousing of the wound is a function of the cambium layer (the thin green inner bark), and occurs quite rapidly on healthy plants when smooth cuts are made, as when a sharp shear or fine-toothed saw is used. Because the cambium has its greatest activity in the direction of the length of the shoot or branch, the gardener will observe that the sides of the pruning cut will heal faster than the top or bottom, and elongated wounds will



Three principal types of branches to remove in good tree pruning to insure strong shapely trees. A. Remove limbs that have growth directly into interior of crown. B. Remove limbs that rub and chafe another limb or show possibility to do so in later years. C. Remove secondary leader, also limbs that form narrow "V" crotch. Observe A. and B. in shrub pruning also.



To remove large limbs from trees. A. Shows incorrect procedure. Initial cut from top and close to trunk usually results in tearing bark from trunk. It is advised to remove limb with three cuts indicated in B. and C.

heal faster than the more round wounds. Also, for this reason, the cambium fails to heal over stub ends of branches when the pruning cut is made too far from the trunk or remaining limb. Proper places to make cuts for rapid healing of wounds is best described in the preceding diagrams.

Removal of large limbs presents a special problem in pruning, and the gardener will do well to follow a technique commonly practiced by most professional tree surgeons. Large limbs, because of their weight and length, exert a great pressure at the point of union with the trunk or larger limb. An attempt to remove such a limb with a single cut close to the trunk will invariably result in the limb breaking loose and tearing away bark immediately below, before the cut is completed, thus greatly increasing the area of the wound. Limbs more than one inch in diameter are best removed in several steps. First, the outer third of the limb is removed with lopping shears or saw. Next, two consecutive cuts are made near the trunk. These may be about four to six inches from the trunk for limbs one inch in diameter, and proportionately further out for larger limbs. The first of these cuts is made on the underside of the limb and through at least one-fourth of the diameter. The second cut is made on the top of the limb and slightly further out, away from the trunk. The pruner continues to saw this cut until the limb falls free, which it will do without tearing bark.

The remaining stub, now greatly reduced in weight, can be sawed away, making the cut from the top and as close as possible to the trunk. In this manner the gardener will experience slight, if any, tearing of the bark. The wound, of course, is painted immediately.

RECOMMENDED READING

The Pruning Manual, Everett P. Christopher, the Macmillan Co. 1954.

Shade Tree Pruning, A. R. Thompson, Tree Preservation. Bulletin #4, National Park Service, U. S. Gov. Printing Office. 1955.

Section on Pruning in the Standard Cyclopedia of Horticulture, L. H. Bailey, the Macmillan Co. 1928.

MISSOURI BOTANICAL GARDEN PROGRAMS

SPECIAL Shows and Displays in the Floral Display House:

Orchid Show, January 23 to February 28.

African Violet Show March 5 and 6.

Free nature program for children, seven to ten and eleven to eighteen years, are held every Saturday morning from 10:00 to 11:30 A. M.

The Mystery of the Orchid	February 6
Color Sound Movies	February 13
Plants in a Capsule	February 22
Three Cheers for the Green Thumb (you can take your plants home)	February 27
The Story of the Pin Cushion Forests	March 5
The Life Secret of a Plant	March 12
Make Your Own Dwarf Gardens	March 19
Color Sound Movies	March 26

Free summer programs of nature study for children are supported by a gift from the Pitzman Foundation. Trails, craftwork and group activities are offered. Schedules for these programs may be obtained in June from the Main Gate.

COURSES

The following courses are open to any interested person. Certificates are awarded upon successful completion of any course. Information on registration may be obtained by calling PROspect 6-5567.

Please send all registration fees to

Missouri Botanical Garden
2315 Tower Grove Ave.
St. Louis 10, Mo.

HORTICULTURE

Course 122. Spring Horticulture.

Place: Museum Building.

Time: (Register for only ONE of the sections offered.)

Section I, Wednesday afternoon 1:00–4:00 P. M. March 16, 23, April 6, 13, 20.

Section II, Friday morning 9:00 A. M.–1200 Noon. March 18, 25, April 8, 15, 22.

Section III, Monday afternoon 1:00 –4:00 P. M. March 21, 28, April 11, 18, 25.

Section IV, Tuesday nights 7:00–10:00 P. M. March 22, 29, April 12, 19, 26.

Fee: $18.00 for five meetings.

Enrollment: Each section is limited to 20 students. Please register early.

This course will teach beginning gardeners how to propagate plants from seed. Special emphasis is placed on annuals and perennials. Each section will include a lecture period and a practice period. The lectures will discuss factors effecting plant growth and practical means for control, such as optimum supply of heat, light, moisture, air, fertilizer, lime, mulch, pest and disease control. Each student will receive seeds and four metal flats with sterilized soil. There will be enough space to grow 300–350 seedlings which, with the flats, may be taken home. Seeds of those plants particularly desired by a student should be brought to the first session.

Instructors, Mr. Clarence Barbre, Mr. Kenneth Peck.

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SOME FACTS ABOUT SHAW'S GARDEN

The Missouri Botanical Garden (the official name chosen by Mr. Shaw) carries on the garden established by Henry Shaw over a century ago at TOWER GROVE, his country home. It is a private institution and has no support from city or state. The old stone walls and cast-iron fences, the Linnaean House, the Museum, the Mausoleum, and the TOWER GROVE mansion all date from Mr. Shaw's time. Since his death, as directed in his will, the Garden has been in the hands of a Board of Trustees who appoint the Director.

The Garden is open every day in the year (except New Year's and Christmas) from nine A. M. until seven P. M. spring to fall and until six in the winter time though the greenhouses close at five. TOWER GROVE, itself, Mr. Shaw's old country home, is open from one until four, admission fifty cents, with special guides. The Garden is nearly a mile long and has several entrances. The Main Entrance, the one most used by the general public, is at Tower Grove and Flora Place on the Sarah bus line (No. 42). The Park Southhampton buses (No. 80), direct from downtown, pass within three blocks of this entrance and stop directly across the street from the Administration Building at 2315 Tower Grove Avenue. The latter is the best entrance for students, visiting scientists, etc. It is open to such visitors after 8:30 A. M., but is closed on Saturdays, Sundays, and holidays. The Cleveland Ave. gate, 2221 Tower Grove, is nearly always open, and there is a service entrance on Alfred Avenue, one block south of Shaw Avenue.

Since Mr. Shaw's time an Arboretum has been developed at Gray Summit, Mo., State Highway 100 adjacent to Interstate Highway 44. It is open every day in the year and has auto roads as well as foot trails through the wild-flower reservation. There is a pinetum and an extensive display of daffodils and other narcissi which are at their best in April.